ELECTRODIAGNOSTIC TESTS ARE UNLIKELY TO CHANGE MANAGEMENT IN THOSE WITH A KNOWN CAUSE OF TYPICAL DISTAL SYMMETRIC POLYNEUROPATHY

We read with interest the Issues and Opinions article by Bodofsky et al. summarizing the existing evidence and concluding that "the majority of patients who present with new symptoms and signs suggestive of distal symmetric polyneuropathy (DSP) should undergo electrodiagnostic (EDx) testing."[1] However, we interpret the same evidence differently. The authors cite 4 supporting studies and 1 conflicting study by our group.[2–6] One of the supporting studies included patients with symptoms or signs of chronic polyneuropathy evaluated at an academic medical center.[6] Rosenberg et al. found that 90 of 172 (52%) EDx evaluations contributed to the diagnosis in the entire population although they did not evaluate how often management changes occurred. However, they also found that 69 of 73 (95%) EDx evaluations of patients with polyneuropathy of known cause were considered unnecessary, leading them to conclude: "In patients with signs and symptoms of a DSP with duration of more than 6 weeks and a known cause," "confirmation of peripheral neuropathy by neurophysiological studies is unnecessary."

Furthermore, 2 of the other cited studies, while concluding that EDx testing often changes management among all tertiary electrodiagnostic referrals, contained small numbers of suspected polyneuropathy patients (16% and 21%, respectively), limiting inferences of the benefits of EDx testing in polyneuropathy.[4,5] Of note, no standard definition of polyneuropathy was used and referring physicians included all provider types. In the last study, Cho et al. included 44 patients evaluated at a tertiary EDx laboratory who had a referral diagnosis of DSP and paresthesias, dysesthesias, or pain in both feet.[3] Excluding 8 patients with motor predominant symptoms, a red flag indicating an atypical neuropathy, 33% of EDx evaluations led to a management change. While this small study supports the conclusion of Bodofsky et al., it has important limitations: tertiary setting, lack of a standardized DSP definition, and limited detail of management changes.

In contrast, our population-based study[2] included 458 patients seen by community neurologists in Texas and meeting the Toronto consensus definition of probable DSP. We found that EDx testing changed the etiology and/or management in 2 of 366 patients (0.5%), and we provided detailed management changes for all patients.

Evaluating the evidence, we conclude that the benefit of EDx testing is low in patients with DSP of known cause based on 2 studies that evaluated this clinical scenario.[2,6] Both studies conclude that EDx testing should not be routinely performed in this population. Importantly, these 2 studies were the largest and used the most precise case definitions. What remains unknown is which clinical factors should prompt EDx testing in patients with DSP. We have proposed that asymmetry, nonlength dependence, motor predominance, and acute/subacute onset are likely important clinical factors. To move our field forward we need higher quality evidence: a prospective, adequately powered, multi-site study including community and academic settings, using precise inclusion criteria and documenting potential clinical factors that may indicate the need for EDx testing. Funding high quality studies to define the precise role of EDx testing in DSP should be a priority.

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1. Bodofsky EB, Carter GT, England JD. Is electrodiagnosic testing for polyneuropathy overutilized? Muscle Nerve 2017;55:301–304.
2. Callaghan BC, Kerber KA, Lisabeth LL, Morgenstern LB, Longoria R, Rodgers A, et al. Role of neurologists and diagnostic tests on the management of distal symmetric polyneuropathy. JAMA Neurol 2014; 71:1143–1149.
3. Cho SC, Siao-Tick-Chong P, So YT. Clinical utility of electrodiagnostic consultation in suspected polyneuropathy. Muscle Nerve 2004;30: 659–662.
4. Kothari MJ, Blakeslee MA, Reichwein R, Simmons Z, Logigian EL. Electrodiagnostic studies: are they useful in clinical practice? Arch Phys Med Rehabil 1998;79:1510–1511.
5. Kothari MJ, Preston DC, Plotkin GM, Venkatesh S, Shefner JM, Logigian EL. Electromyography: do the diagnostic ends justify the means? Arch Phys Med Rehabil 1995;76:947–949.
6. Rosenberg NR, Portegies P, de Visser M, Vermeulen M. Diagnostic investigation of patients with chronic polyneuropathy: evaluation of a clinical guideline. J Neurol Neurosurg Psychiatry 2001;71:205–209.

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REPLY

We stand by the clinical evidence, numerous expert opinions, and conclusions of our article on the utilization of electrodiagnostic (EDX) testing for distal symmetric polyneuropathy (DSP).[1] Most patients with signs and symptoms of DSP require EDX testing. The 4 studies cited showed that a vastly higher percentage of patients had changes in diagnosis or management (40%–50%) after EDX testing than the <1% found by Callaghan *et al.* ($P < 0.001$ in all cases).[2] Other large studies have demonstrated similar results.[3] Callaghan and colleagues used the Toronto Diabetic Neuropathy Group definition for "probable neuropathy." However, this group required abnormal nerve conduction studies for confirmation of diagnosis.[4] As we indicated in our article, Callaghan and colleagues also gave no explanation for how a change of diagnosis or management was attributed to a specific test (i.e., EDX) when other tests were obtained.[1]

Diagnosing DSP without EDX testing assumes a high degree of accuracy for the history and neurological

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